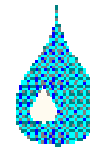


Wellhead Protection

An Ounce of Prevention



What is Wellhead Protection?

WHP is a program to minimize the risk of contamination to public groundwater supplies.

Accomplished by managing the land area surrounding a well.

Benefits of Wellhead Protection

- ***To save money by avoiding costs for cleaning up groundwater and/or providing an alternate water supply***
- ***To reduce potential health risks***
- ***To prevent negative economic impacts on community development***
- ***To protect a water supply for the future***

Wellhead Protection Plan Requirements

Regulatory component

(wells drilled May 1, 1992 or after)

Voluntary component

(wells drilled before May 1, 1992)

Components of Wellhead Protection

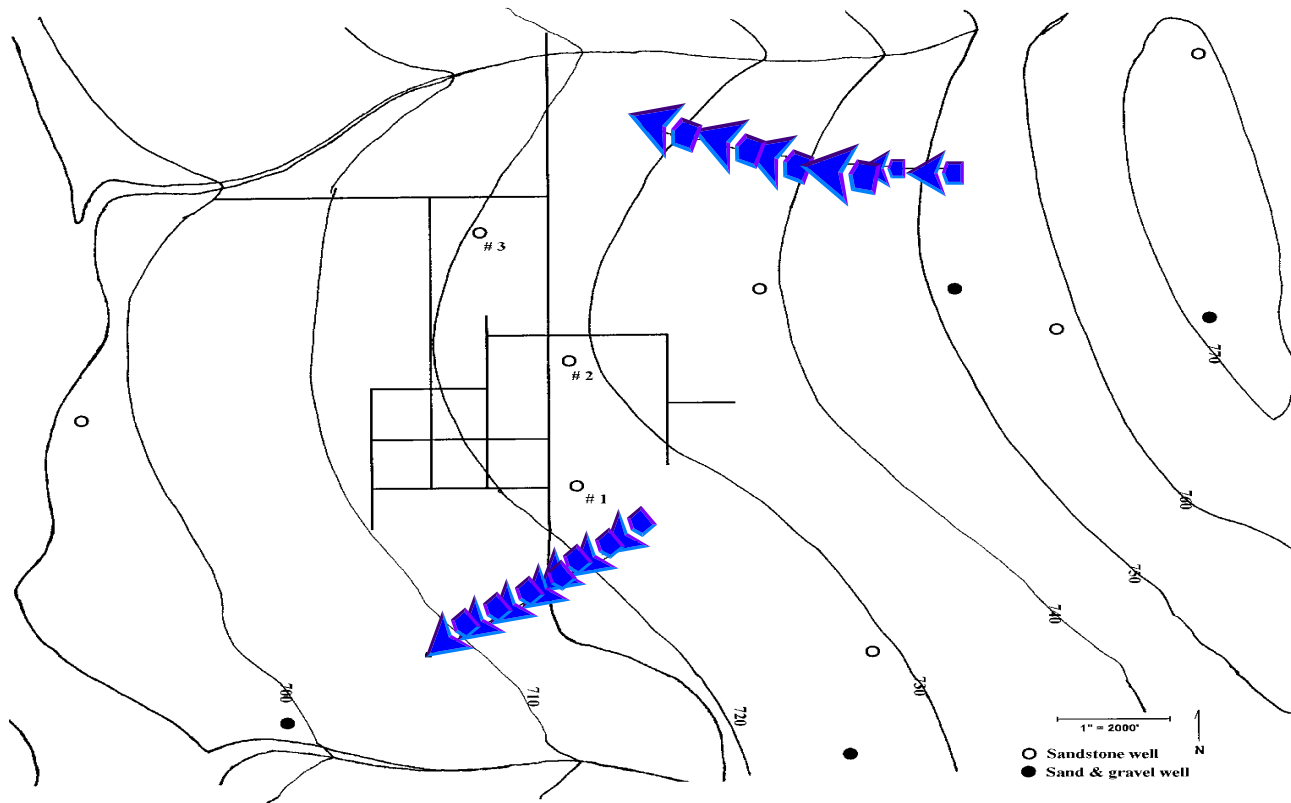
- ① Establish a local planning team**
- ② Define the WHP area around the well**
- ③ Identify potential contamination sources**
- ④ Develop and implement a management plan**
- ⑤ Develop a contingency plan**

Wellhead Protection Steps

- ① Determine the direction of groundwater flow
- ② Determine the Zone of Influence for the well
- ③ Determine the Recharge Area
- ④ Define the Wellhead Protection Area

Determining Groundwater Flow Direction

Water Table Map - a contour map of the elevation of the water table. Water flows from higher to lower water table elevations. Flow is generally at right angles to the contour lines.



Determining the Water Table

Water table maps are available for many counties and specific projects from the Wisconsin Geological and Natural History Survey (WGNHS) or the United States Geological Survey (USGS).

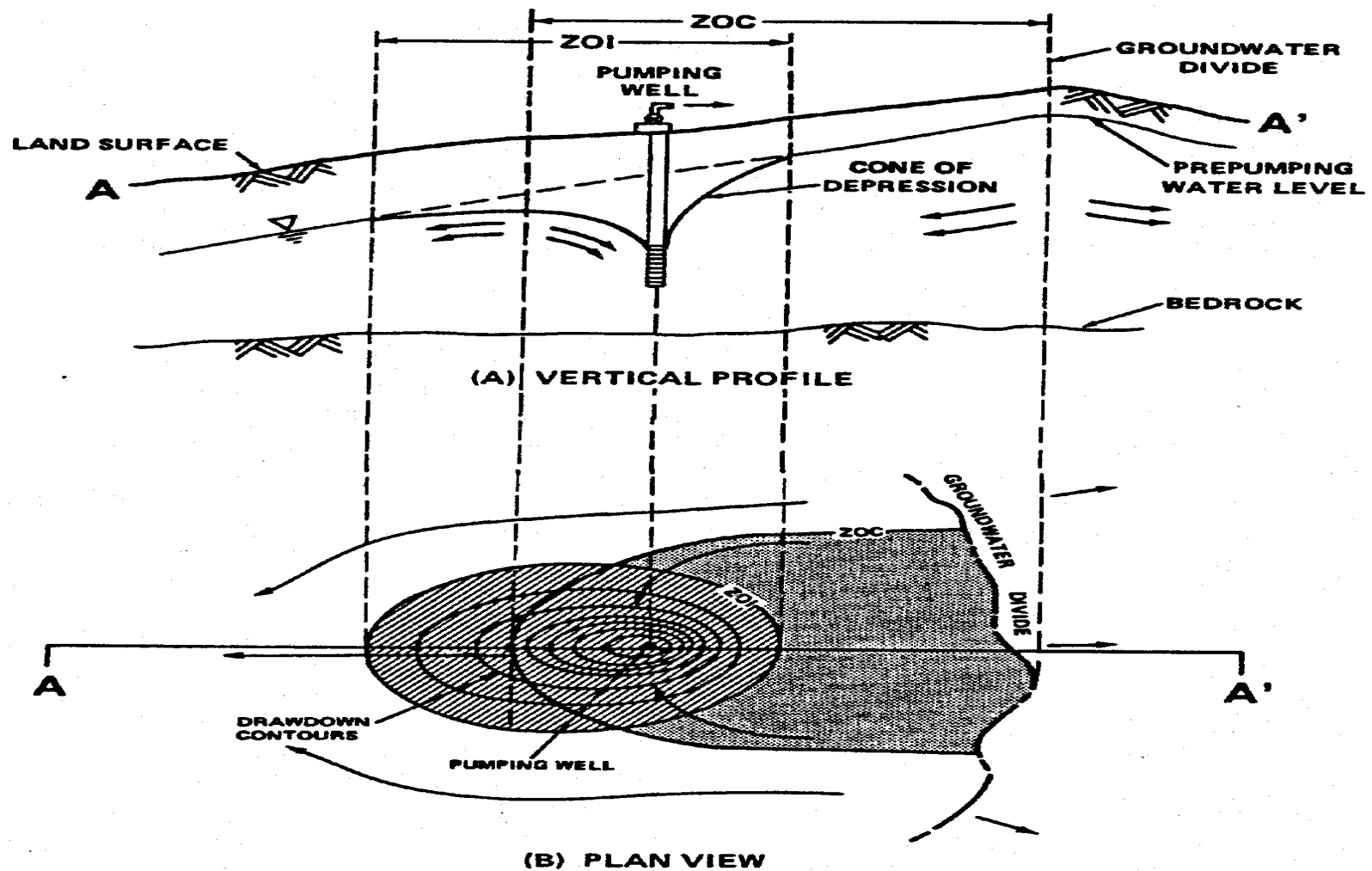
Local areas can be checked with well construction reports from the WGNHS or the Wisconsin DNR CD or website.

Maps can be generated for specific sites.

Wellhead Protection Steps

- ① Determine the direction of groundwater flow
- ② Determine the Zone of Influence for the well
- ③ Determine the Recharge Area
- ④ Define the Wellhead Protection Area

Zone of Influence



LEGEND:

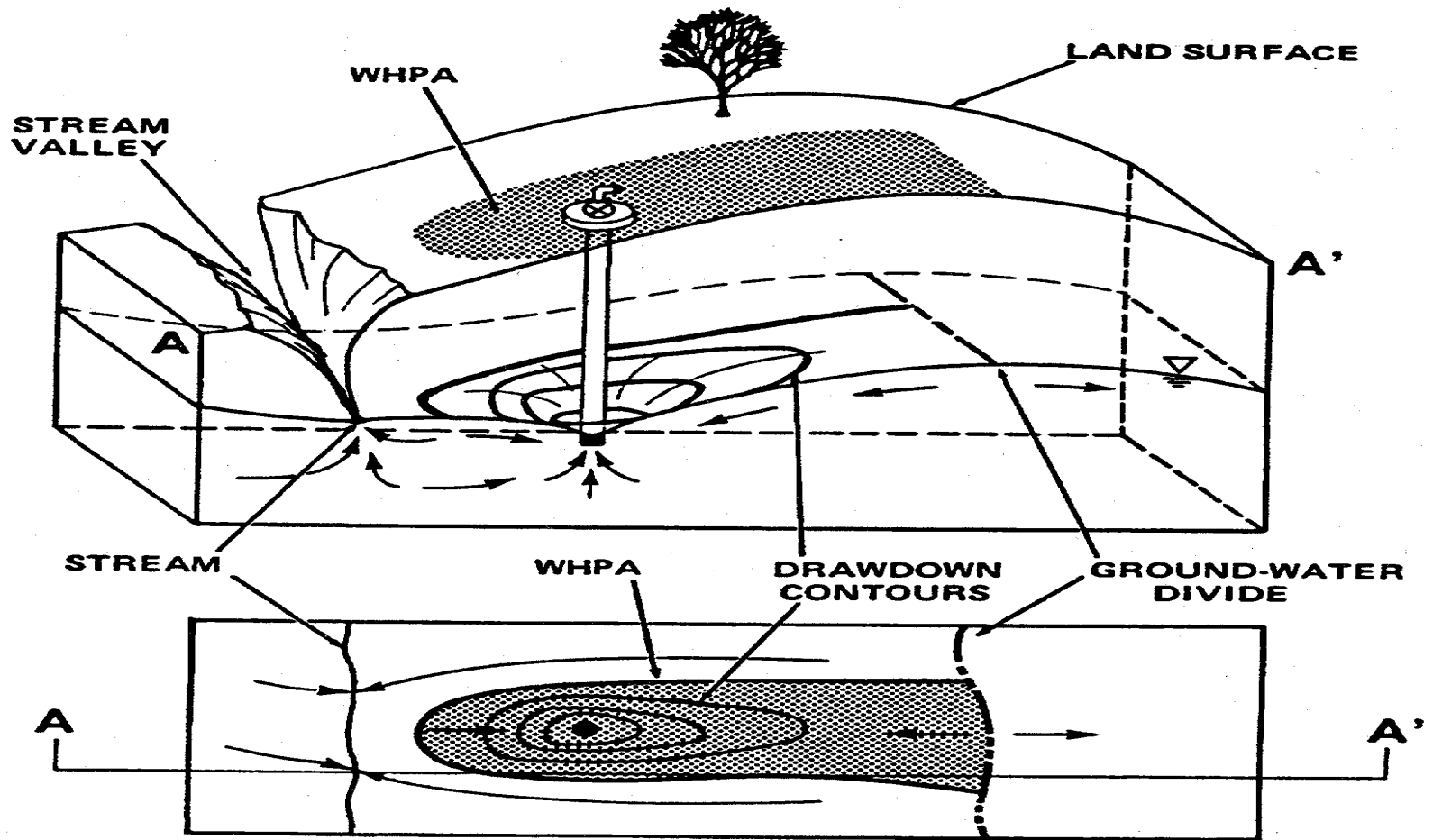
- Water table
- Ground-water Flow Direction
- Pumping Well
- ZOI** Zone of Influence
- ZOC** Zone of Contribution

(From EPA June, 1987)



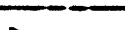
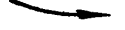

Wellhead Protection Steps

- ① Determine the direction of groundwater flow
- ② Determine the Zone of Influence for the well
- ③ Determine the Recharge Area
- ④ Define the Wellhead Protection Area

Recharge Area



LEGEND:

-  Water Table
-  Pumping Well
-  Ground-water Divide
-  Direction of Ground-water Flow
-  WHPA

Total area contributing water to a well back to the ground-water divide.

Wellhead Protection Steps

- ① Determine the direction of groundwater flow
- ② Determine the Zone of Influence for the well
- ③ Determine the Recharge Area
- ④ Define the Wellhead Protection Area

Wellhead Protection Area

Delineation Methods

Two methods:
Fixed Radius & WHPA

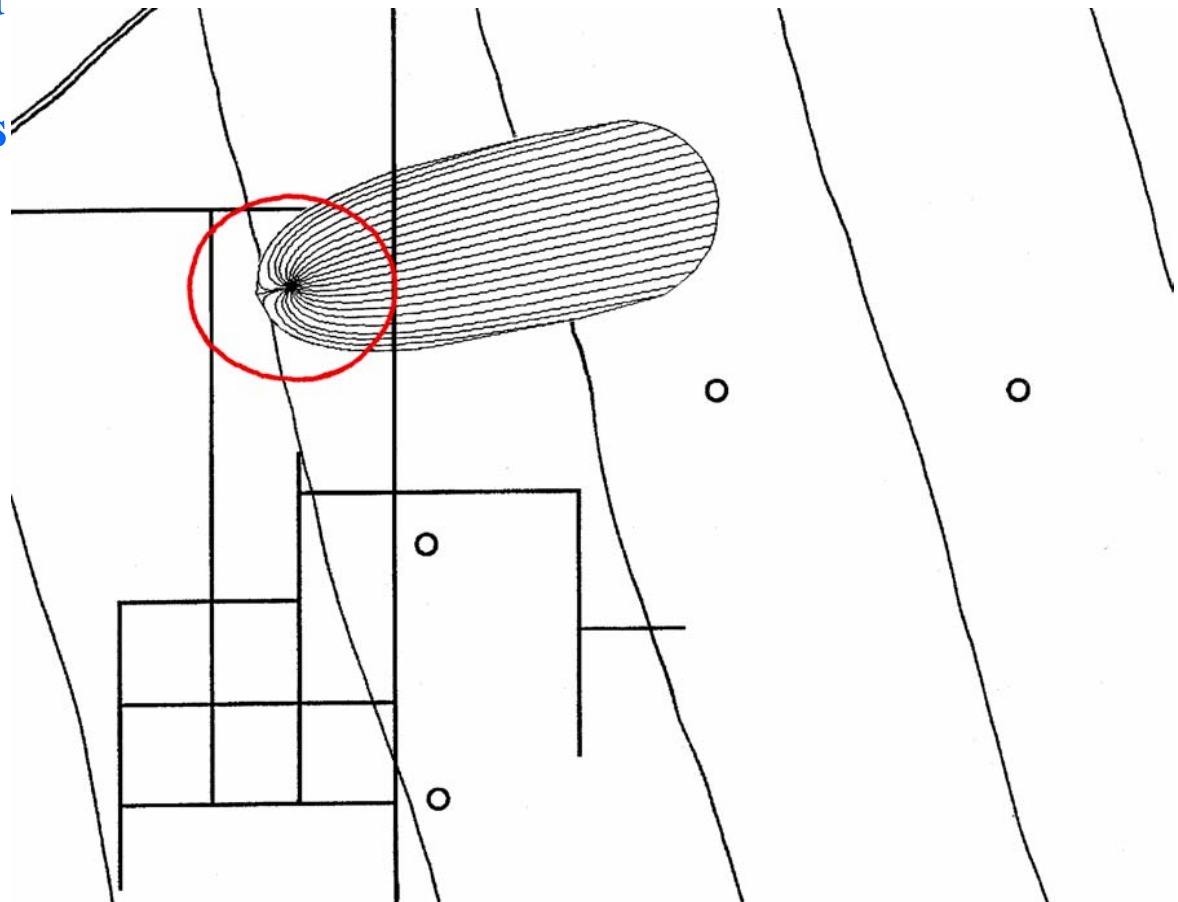
Fixed Radius Method

- Arbitrary Fixed Radius
- Calculated Fixed Radius

WHPA Codes

WHP Models

- GFLOW
- WHAEM
- ModFlow

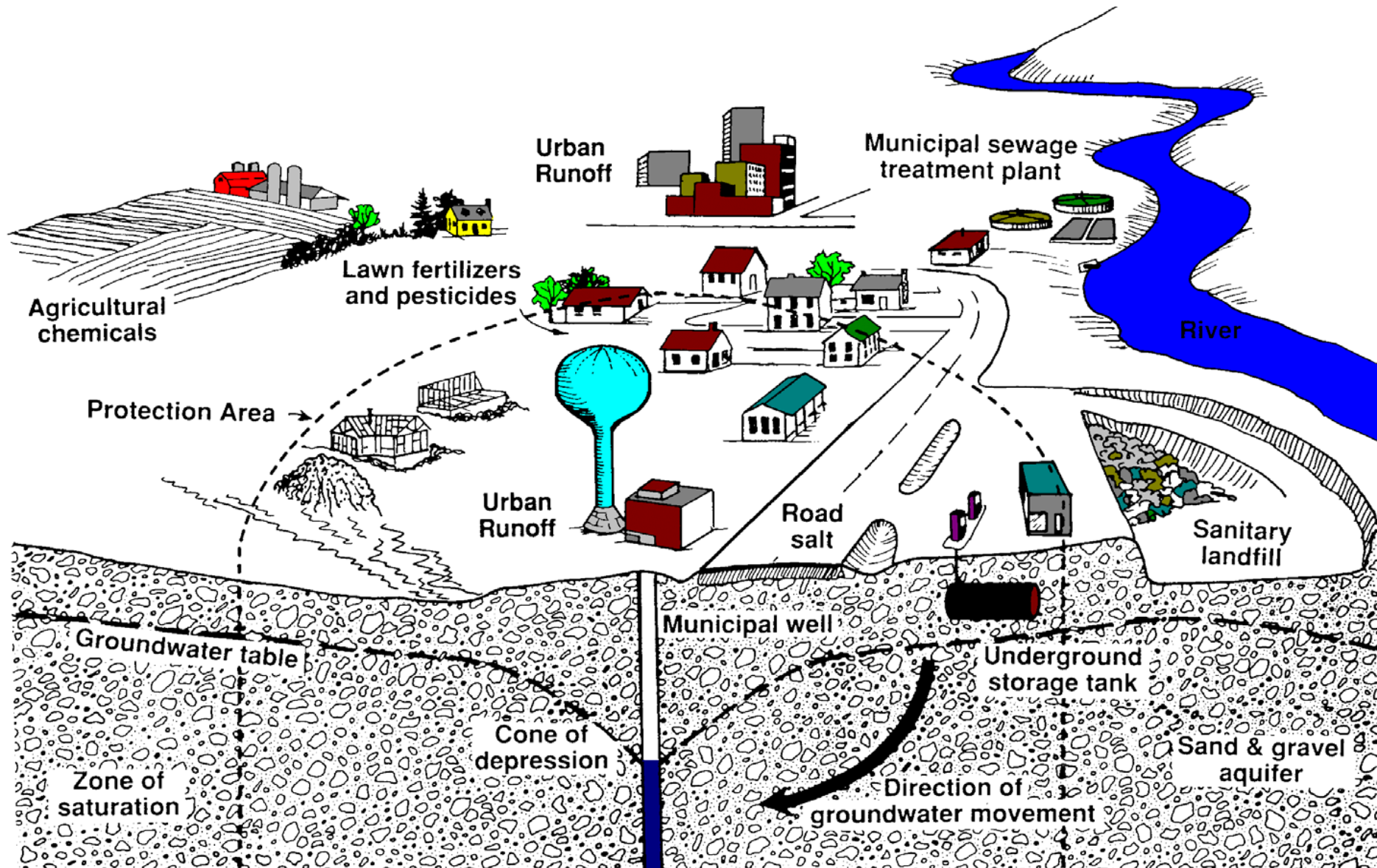


Wellhead Protection Steps

cont.

- ⑤ Inventory Potential Contamination Sources
- ⑥ Develop a Management Plan
- ⑦ Develop a Public Education Strategy
- ⑧ Develop a Water Conservation Program
- ⑨ Develop a Contingency Plan

Contamination Sources



Inventorying Contaminant Sources

A contaminant source inventory is an effort to locate and identify those facilities and activities within a designated area that may be a potential source of contamination to a public water supply well.



Wellhead Protection Steps

cont.

- ⑤ Inventory Potential Contamination Sources
- ⑥ Develop a Management Plan
- ⑦ Develop a Public Education Strategy
- ⑧ Develop a Water Conservation Program
- ⑨ Develop a Contingency Plan

Management Plan

- **Zoning Ordinances** (municipal or county wide)
- **Subdivision Regulations**
- **Regional Policy Development Plan**
- **Land Use Planning**
- **Setback Distances**
- **Public Education Campaign**
- **Clean Sweep Program**
- **Groundwater Monitoring**
- **Well Abandonment**

Wellhead Protection Setback Distances

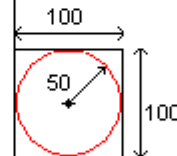
What's the confusion all about?

A collection of setback distance values in various colors and orientations, illustrating confusion. The values are: 50 feet (black, top center), 1000 feet (orange, top right), 200 feet (purple, middle left), 100 feet (blue, middle center), 600 feet (green, bottom left), 400 feet (magenta, bottom center), and 1200 feet (red, bottom right). The text is scattered across the lower half of the slide, with some values appearing to be part of a larger, unformed set of data.

Setback Distance
50 feet
100 feet
200 feet
400 feet
600 feet
1000 feet
1200 feet

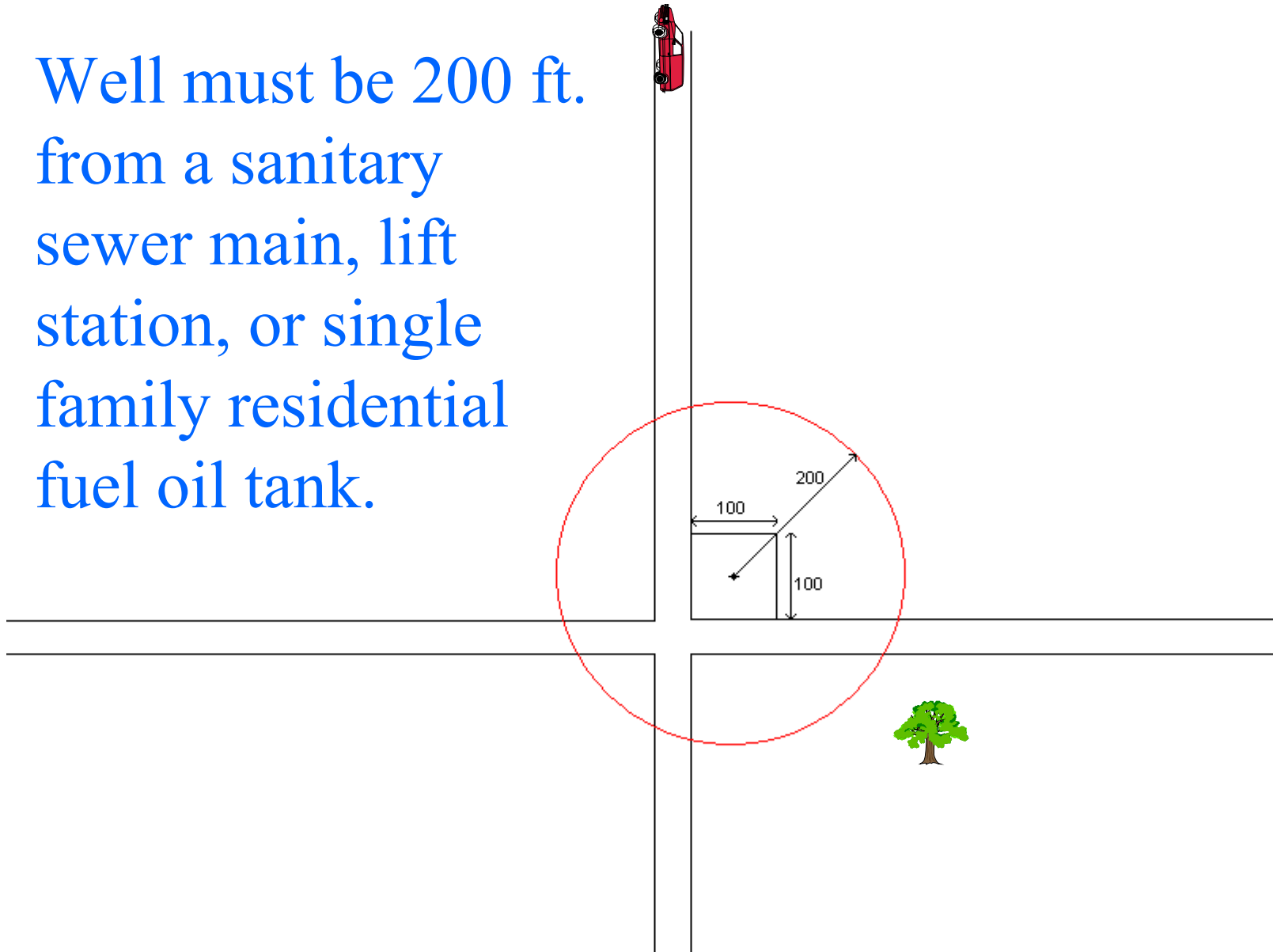
Wellhead Protection Setback Distances

Property must be 100 ft. by 100 ft. Well must be 50 ft. from a storm sewer main.



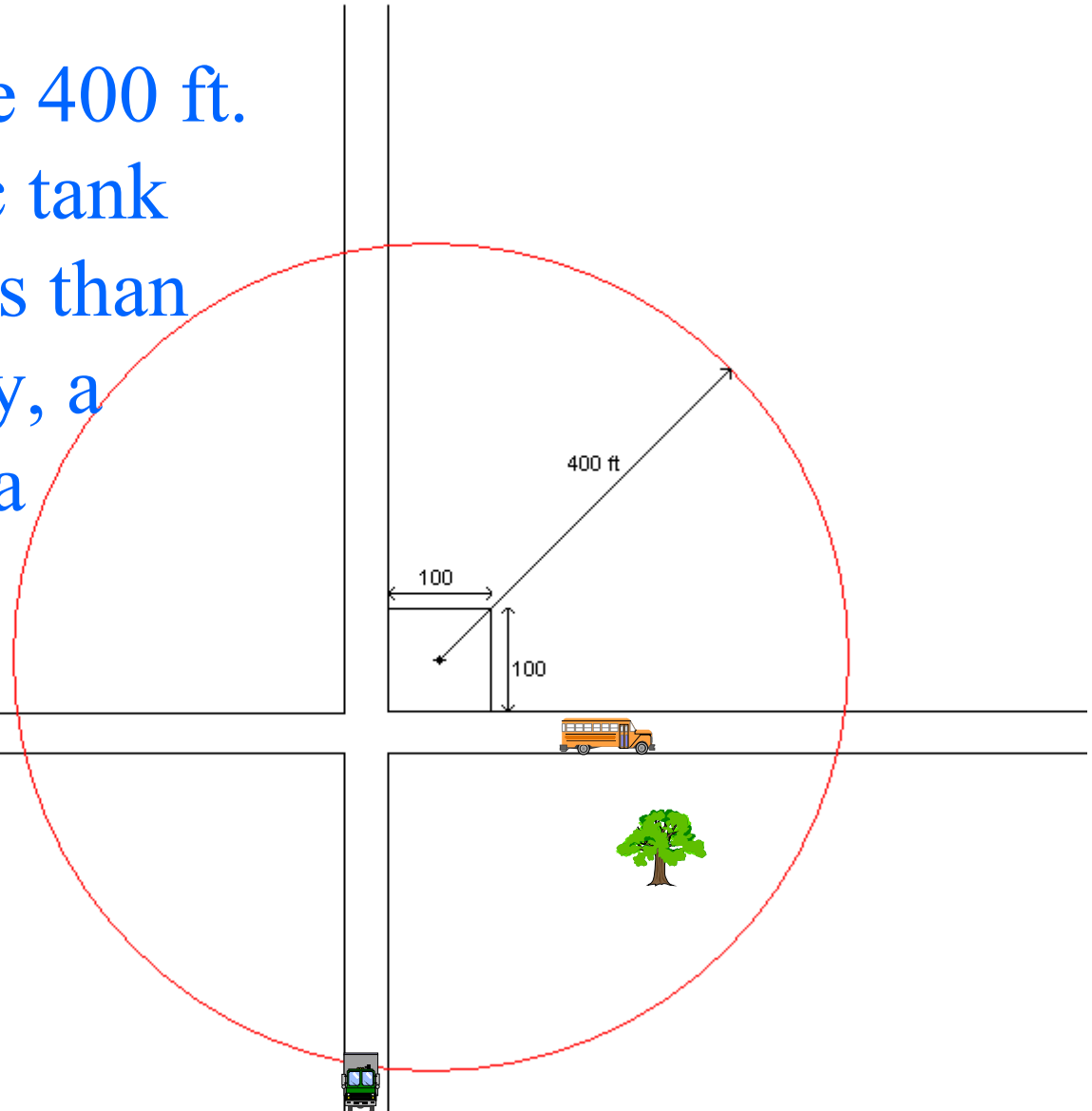
Wellhead Protection Setback Distances cont.

Well must be 200 ft.
from a sanitary
sewer main, lift
station, or single
family residential
fuel oil tank.



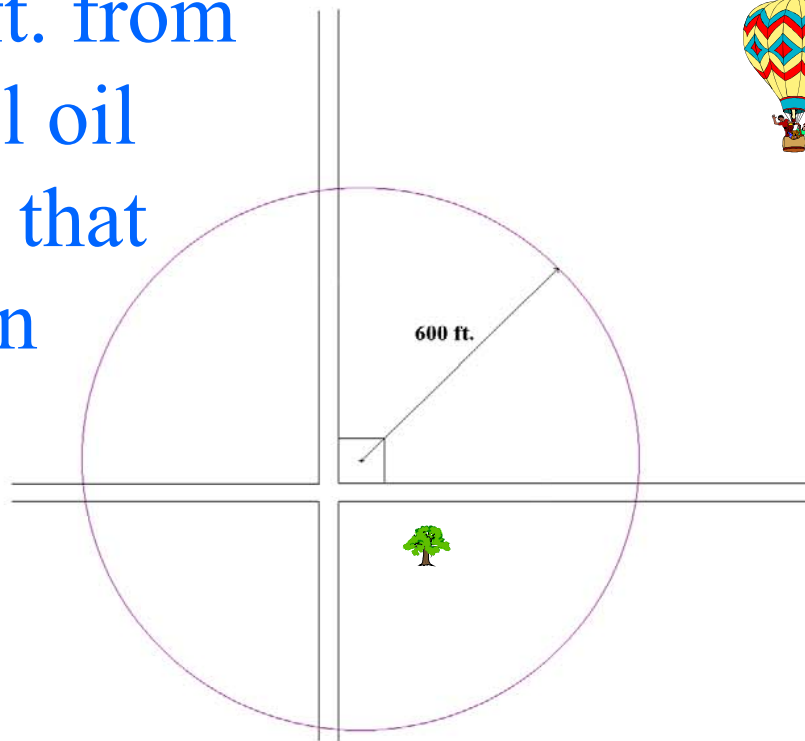
Wellhead Protection Setback Distances cont.

Well must be 400 ft.
from a septic tank
receiving less than
8,000 gal/day, a
cemetery or a
storm water
drainage
pond.



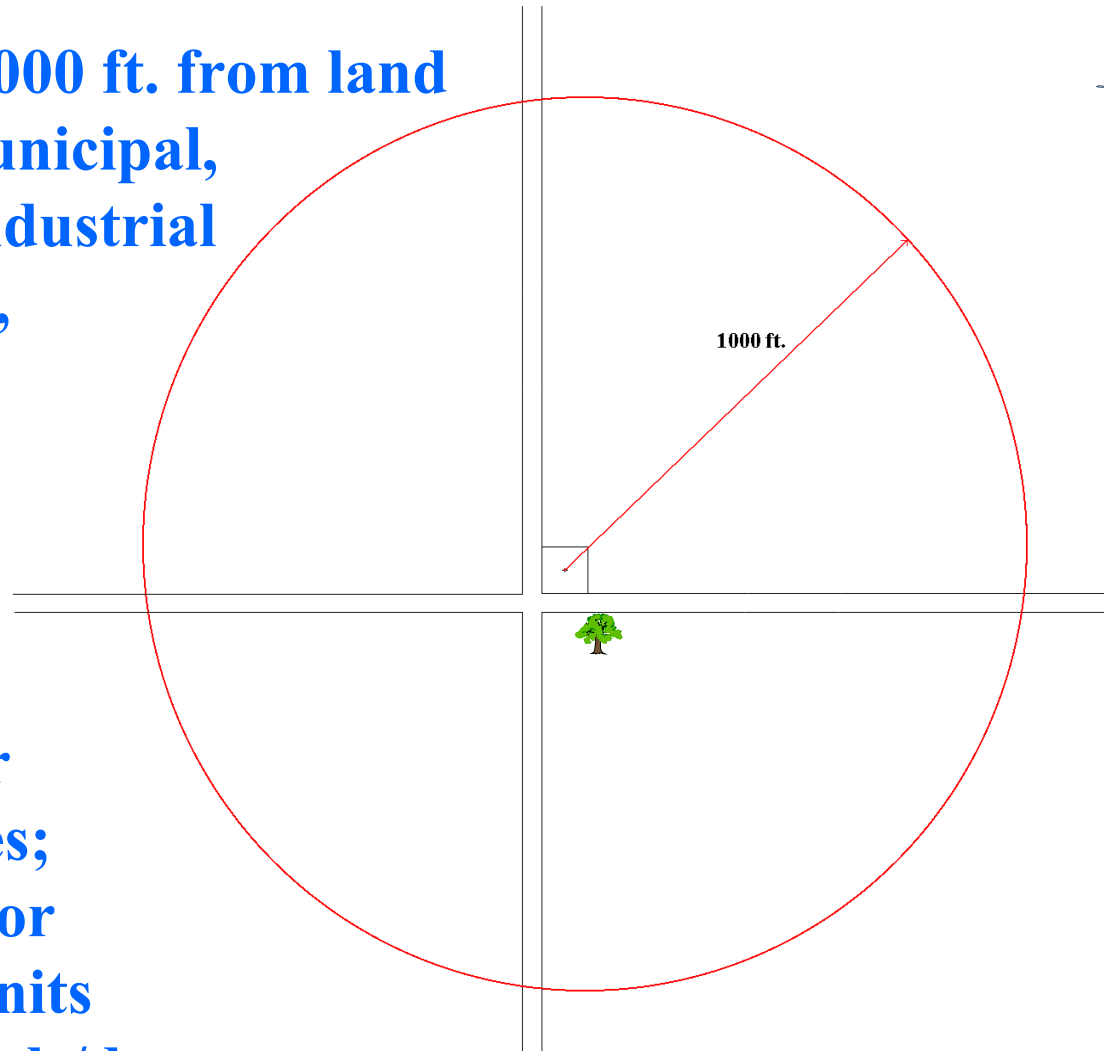
Wellhead Protection Setback Distances cont.

Well must be 600 ft. from any gasoline or fuel oil storage installation that has received written approval from the Department of Commerce or its designated agent.



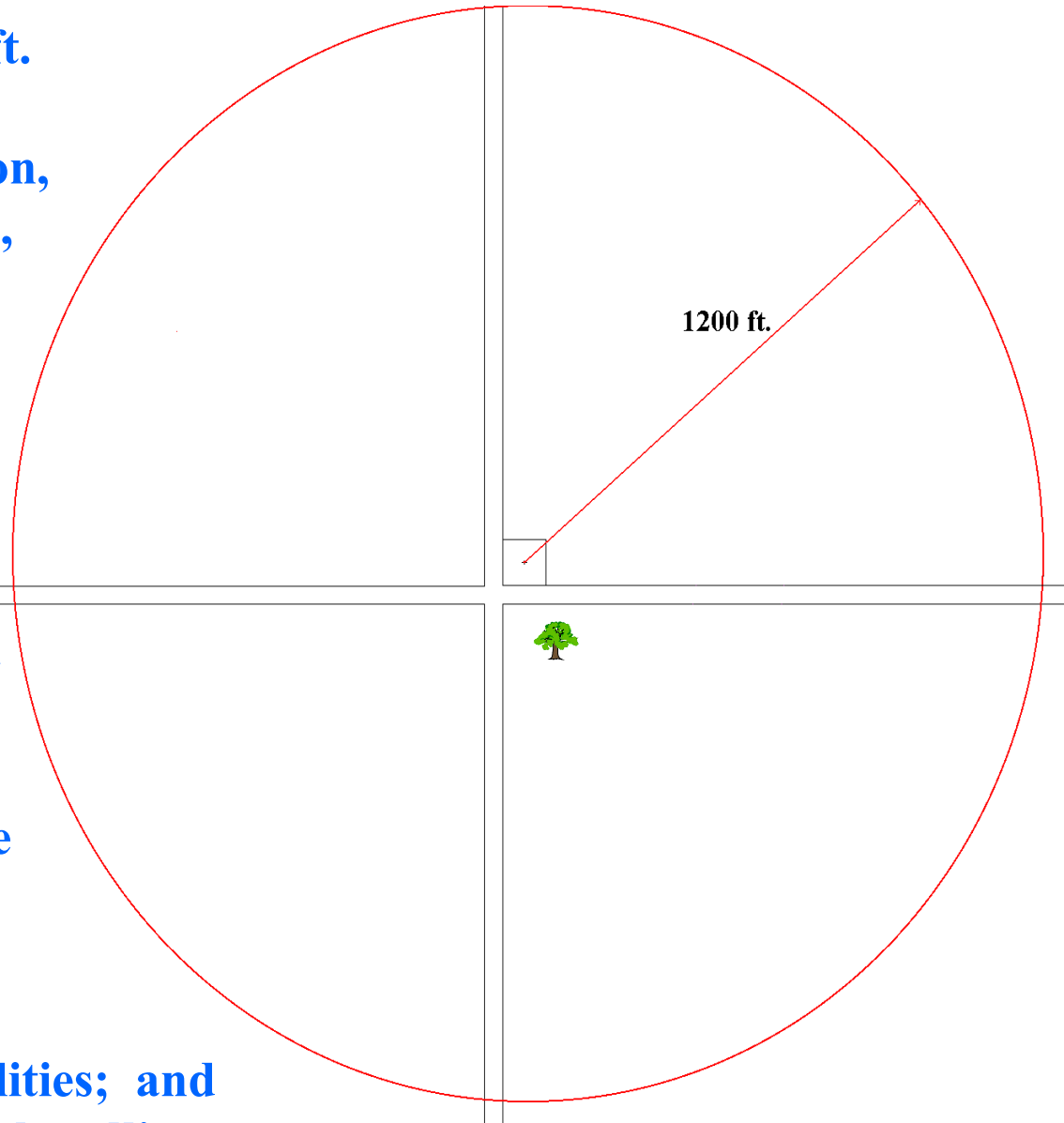
Wellhead Protection Setback Distances cont.

A well must be 1000 ft. from land application of municipal, commercial or industrial waste; industrial, commercial or municipal waste water lagoons or storage structures; manure stacks or storage structures; and septic tanks or soil adsorption units receiving 8,000 gals/day or more.



Wellhead Protection Setback Distances cont.

A well must be 1200 ft. from any solid waste storage, transportation, transfer, incineration, air curtain destructor, processing, wood burning, one time disposal or small demolition facility; sanitary landfill; coal storage area; salt or deicing material storage area; gasoline or fuel oil storage tanks that have no written approval; bulk fuel storage facilities; and pesticide or fertilizer handling or storage facilities.



Wellhead Protection Steps

cont.

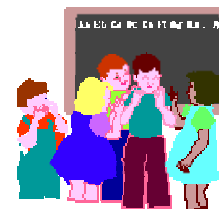
- ⑤ Inventory Potential Contamination Sources
- ⑥ Develop a Management Plan
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- ⑨ Develop a Contingency Plan

Public Education

Make WHP Plan Available

Make Publications Available

Schools and Youth Groups



Focused Education - targeted to inventory

Local Media

• **Newspaper Advertisement**



• **Radio**



• **Television**



Directed Mailings

Wellhead Protection Steps

cont.

- ⑤ Inventory Potential Contamination Sources
- ⑥ Develop a Management Plan
- ⑦ Develop a Public Education Strategy
- ⑧ Develop a Water Conservation Program
- ⑨ Develop a Contingency Plan

Water Conservation

Brochures

Water Accountability

Public Education Program

Water Saving Devices



Sprinkling Ban or Restriction



Rate Structure

Wellhead Protection Steps

cont.

- ⑤ Inventory Potential Contamination Sources
- ⑥ Develop a Management Plan
- ⑦ Develop a Public Education Strategy
- ⑧ Develop a Water Conservation Program
- ⑨ Develop a Contingency Plan

Contingency Plan

Emergency Government

- Police



- Fire



- Utility (water & power)



Alternate Water Supply Source

Capacity Development

Conservation

Land Use Planning



Assistance Available to Communities

**Wisconsin Department of
Natural Resources**



Wisconsin Rural Water Association

**Central Wisconsin Groundwater
Center**

Private Consulting Firms

Wisconsin DNR Assistance

Can provide publications or a video, speak at public meetings, or provide help starting a wellhead protection plan for existing water supply wells drilled before May 1, 1992.

**Phone: 877-268-WELL (toll free)
or 608-266-9265**

E-mail: Lindod@dnr.state.wi.us

Web Site:

[Http:\\www.dnr.state.wi.us/org/water/dwg/gw/whp.htm](http://www.dnr.state.wi.us/org/water/dwg/gw/whp.htm)

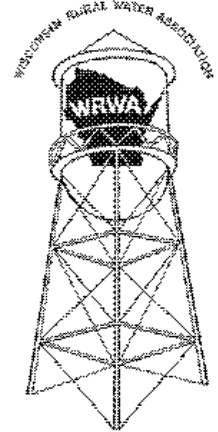


Rural Water Assistance

Can provide technical assistance to communities with public water supplies serving less than 10,000 people

**350 Water Way
Plover, WI 54467
(715) 344-7778**

**E-mail: wrwa@coredcs.com
Website: [Http://www.wrwa.org](http://www.wrwa.org)**



Central Wisconsin Groundwater Center Assistance

Communities in Central Wisconsin

**College of Natural Resources, room 224
University of Wisconsin - Stevens Point
Stevens Point, WI 54481
(715) 346-4270**

E-mail: gndwater@uwsp.edu

Website: [Http://www.uwsp.edu/groundwater](http://www.uwsp.edu/groundwater)

Consultant Assistance

For a fee, consultants will provide technical expertise, assistance, or complete development of a wellhead protection plan.

Check Engineering Firms in the yellow pages.



Wellhead Protection

An Ounce of Prevention

